DETAILED ACTION

Restriction/Election

1. In response to the communication received on Feb. 29, 2008 from Robert J. Patch, the election with traverse of group I, claim 16 with respect to SEQ ID NO:2, is acknowledged. Linking claims 15, 22-25, and 29 will also be examined. Because applicant did not distinctly and specifically point out any errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). This restriction requirement is MADE FINAL.

Claims 15-31 are pending. Claims 17-21, 26-28, 30, and 31, are withdrawn because they are directed to non-elected inventions. Claims 15, 16, 22-25, and 29 are examined in this office action.

Specification

2. The specification is objected to because the description of Figure 1 describes a panel A and a panel B, however, the figure does not have a panel A and a panel B; therefore, the description does not match the figure.

3. The use of the following trademarks has been noted in this application: TWEEN, EPPENDORF TUBES, QIAQUICK, BACTO, and HYBOND. They should be written in all capital letters wherever they appear; or alternatively, they should be denoted with the registered trademark symbol, ®, and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

4. The abstract of the disclosure is objected to because it is not descriptive enough of the elected invention. The abstract should be between 50 and 150 words in length and it should specify that the invention comprises an Arabidopsis stomatal-specific promoter. Correction is requested. See MPEP § 608.01(b).

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The new title should specify an Arabidopsis stomatal-specific promoter.

Claim Objections

6. Claims 15 and 16 are objected to because of the following informalities: the format for reciting a sequence identifier is improper. The Applicant is advised to replace "No." with - - NO: - - . Appropriate correction is requested.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "selective" in claim 15 is a relative term which renders the claim indefinite. The term "selective" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear if this means expression in the guard cells only, or if it means, higher expression in the guard cells compared to other cells. If it means higher expression

in the guard cells compared to other cells, then how much higher? And compared to which other cells? The metes and bounds are not clear.

Claim 16 recites "wherein said promoter fragment contains SEQ ID NO: 2"; however, the claim from which it depends recites "or to a fragment or variant thereof having promoter activity". This renders the recitation in claim 16 confusing, because it is unclear if the claim is limited to a fragment containing SEQ ID NO: 2, or if it continues to include variants of SEQ ID NO:1. For the purpose of examination, the Examiner will utilize the broadest reasonable interpretation, and the Examiner will interpret claim 16 to be inclusive of fragments comprising SEQ ID NO:2 in addition to variants of SEQ ID NO:1.

8. Claims 15, 16, 22-25, and 29 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The claims are broadly drawn to a construct comprising a nucleic acid operably linked to SEQ ID NO:1 or a variant thereof having promoter activity, and to vectors and plants comprising said construct.

The Applicants describe the promoter sequence of SEQ ID NO:1 taken from the Arabidopsis MYB60 gene (see page 5, lines 16-18). The Applicants describe

fragments of said promoter as SEQ ID NOs: 2, 3, and 4 (see page 5, lines 18-20). They describe constructs comprising the full-length promoter and the fragments of the promoter operably linked to GUS and GFP reporters (see Figure 2). They teach promoter activity for SEQ ID NO:1 and fragments thereof (see pages 10-11).

The Applicants do not describe any "variants" of SEQ ID NO:1 other than fragments of SEQ ID NO:1 that have promoter activity.

The essential feature of the "variant" is that it has promoter activity (see last line in claim 1).

The Federal Circuit has recently clarified the application of the written description requirement to inventions in the field of biotechnology. The court stated that, "A description of a genus of cDNAs may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus." See *University of California v. Eli Lilly and Co.*, 119 F. 3d 1559; 43 USPQ2d 1398, 1406 (Fed. Cir. 1997).

The Applicants fail to describe a representative number of "variants" of SEQ ID NO:1 that have promoter activity. "Variants" can have unlimited numbers of substitutions, deletions, insertions, and additions of nucleotides relative to SEQ ID NO:1. The Applicants only describe the promoter of SEQ ID NO:1 and fragments thereof. Furthermore, the Applicants fail to describe structural features common to

members of the claimed genus of variants. Hence, Applicants fail to meet either prong of the two-prong test set forth by *Eli Lilly*. Furthermore, given the lack of description of the necessary elements essential for promoter activity, it remains unclear what features identify variants capable of such activity. Since the genus of variants has not been described by specific structural features, the specification fails to provide an adequate written description to support the breadth of the claims.

"Variants" can have unlimited numbers of substitutions, deletions, insertions, and additions of nucleotides relative to SEQ ID NO:1. Therefore this recitation encompasses an infinite number of molecules, many of which would not have promoter activity, and most of which were not in the possession of the Applicant at the time of filing. The Applicants have only reduced to practice constructs utilizing the promoter of SEQ ID NO:1 and fragments thereof. Accordingly, the specification fails to provide an adequate written description to support the genus of variants of SEQ ID NO:1 that have promoter activity as set forth in the claims. (See Written Description guidelines published in the Federal Register/Vol. 66, No. 4/Friday, January 5, 2001/Notices: p. 1099-1111).

9. Claims 1-22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for nucleic acids having regulatory activity and having the sequence of SEQ ID NO:1, does not reasonably provide enablement for

nucleic acids having 80, 85, or 90% identity to SEQ ID NO:1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The claimed invention is not supported by an enabling disclosure taking into account the *Wands* factors. *In re Wands*, 858/F.2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988). *In re Wands* lists a number of factors for determining whether or not undue experimentation would be required by one skilled in the art to make and/or use the invention. These factors are: the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples of the invention, the nature of the invention, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art, and the breadth of the claim.

The claims are broadly drawn to a construct comprising a nucleic acid operably linked to SEQ ID NO:1 or a variant thereof having promoter activity, and to vectors and plants comprising said construct.

The Applicants teach the promoter sequence of SEQ ID NO:1 taken from the Arabidopsis MYB60 gene (see page 5, lines 16-18). The Applicants teach fragments of said promoter as SEQ ID NOs: 2, 3, and 4 (see page 5, lines 18-20). They teach constructs comprising the full-length promoter and the fragments of the promoter operably linked to GUS and GFP reporters (see Figure 2). They teach that the only

GUS-staining observed was in stomatal guard cells (see page 10). They teach that the only fluorescence from the GFP that was observed was in the guard cells (see page 11).

The Applicants do not teach any "variants" of SEQ ID NO:1 other than fragments of SEQ ID NO:1 that have promoter activity.

The nature of the invention is a molecular biological approach for initiating transcription in stomatal guard cells in plants.

The state-of-the-art is such that one of skill in the art cannot predict which additions, deletions, substitutions, or insertions within a full-length promoter can be tolerated such that the promoter retains its activity. Mutation of promoter sequences produces unpredictable results. Donald et al (1990, EMBO J. 9:1717-1726) in a mutational analysis of the *Arabidopsis rbcS-1A* promoter found that the effect of a particular mutation was dependent on promoter fragment length (paragraph spanning pg 1723-1724). The region of a given promoter that has a specific activity cannot be predicted and involves the complex interaction of different subdomains (Benfey et al, 1990, Science 250:959-966, see Abstract, Fig. 3-5). Even a very small region may be critical for activity, and the criticality of a particular region must be determined empirically (Kim et al, 1994, Plant Mol. Biol. 24:105-117, Tables 1-4, Abstract, Fig. 1-2).

"Variants" can have unlimited numbers of substitutions, deletions, insertions, and additions of nucleotides relative to SEQ ID NO:1, therefore this recitation encompasses an infinite number of molecules.

Given the lack of guidance in the instant specification, undue trial and error experimentation would be required for one of skill in the art to make multitudes of additions, deletions, substitutions, and insertions and test each one for the ability to confer gene expression to an operably linked nucleic acid. Furthermore, as taught in the prior art, there is a high degree of unpredictability about which substitutions or deletions would be tolerated.

Therefore, given the breadth of the claims; the lack of guidance and working examples; the unpredictability in the art; and the state-of-the-art as discussed above, undue experimentation would be required to make and use the claimed invention, and therefore, the invention is not enabled throughout the broad scope of the claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 15, 16, 22-25, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Tarcynski et al (US Patent No. 6,653,535; issued on Nov. 25, 2003).

The claims are broadly drawn to a construct comprising a nucleic acid operably linked to SEQ ID NO:1 or a fragment or variant thereof having promoter activity, and to vectors and plants comprising said construct.

Tarcynski et al teach a construct that utilizes a modified mas promoter that directs expression in guard cells (see column 7, lines 42-46). Because a "variant of SEQ ID NO:1 can have an unlimited number of insertions, deletions, substitutions or additions relative to SEQ ID NO:1, this mas promoter is a "variant" of SEQ ID NO:1 that has promoter activity. Because claim 16 only limits the fragments that are being claimed and does not include any language excluding "variants", claim 16 is interpreted to encompass "variants" of SEQ ID NO:1 (see rejection under 112, second paragraph, above). Tarcynski et al teach that the construct was cloned into the pBK-CMV expression vector (see column 7, lines 49-50) and this is a binary vector that can be grown in bacteria or eukaryotes. They teach the transformation of maize with this vector (see column 7). They claim transformation of maize, soybean, sorghum, sunflower, alfalfa, canola, safflower, tomato, wheat, rice, peanut, and cotton (see claim 3).

11. No claim is allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy K. Worley whose telephone number is (571) 272-8784. The examiner is on a variable schedule but can normally be reached on M-F 10:00 - 4:00 with additional variable hours before 10:00 and after 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg, can be reached on (571) 272-0975. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Cathy K. Worley/
Patent Examiner, Art Unit 1638